

# Protecting Gardens From Insect Pests

## Scientists Have Constant Struggle to Keep Pace With New Destroyers That Spring Up—How to Check the Ravages

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It is a fact that gardeners of to-day have to contend with insect pests of which our grandfathers and grandmothers never heard or even dreamed would ever exist. As our country and our civilization grow older new insect pests appear and new problems to exercise our boasted ingenuity and efficiency confront us. The gardener, however, can gain considerable comfort from the fact that methods of control for garden pests have more than kept pace with the increase in the numbers and kinds of insects. Obviously there is space here for only a brief discussion of a few of the more common insect pests of gardens and the methods of checking their ravages.

Cabbage, cauliflower, turnips and related plants are subject to the ravages of a number of severe pests, of which the more important ones are the imported cabbage worm (*Pontia rapae*), the cabbage maggot (*Phorbia brassicae*), the cabbage aphid (*Aphis brassicae*), the cabbage looper (*Antographa brassicae*) and certain cutworms.

**IMPORTED CABBAGE WORM** is the common green, velvety caterpillar that occurs on cabbage in nearly every garden. The parent insects are white butterflies with a dark patch in the corner of each front wing and one dark circular spot on each wing of the female and two such spots on the front wings of the male butterfly. The mother butterfly flits rather rapidly over the cabbages, occasionally dipping downward now and then to a cabbage and stopping a moment to deposit a cream colored egg on a leaf. This egg hatches in a few days into the velvety caterpillars, that grow fast and eat ravenously, often devouring much of the outer leaves and working down into the heads. They not only eat into the cabbage head but they muss it up by depositing brownish masses of refuse material.

### How to Destroy the Caterpillar.

This common cabbage pest is best controlled by spraying the plants with a soapy solution of arsenate of lead. The mixture is made by dissolving four pounds of laundry soap in four or five gallons of hot water and then adding enough water to make fifty gallons. To this there should then be added three pounds of paste or one and a half pounds of powdered arsenate of lead. The soap is added for the purpose of sticking the solution to the waxy leaves of the cabbage. The spraying should begin early, so as to catch the first broods of the worms, and may be continued a long time, as a cabbage grows from within outward, and there is no danger of the poison being inclosed within the head.

Another and perhaps simpler method of control for the home garden is by dusting the cabbages with powdered arsenate of lead, 1 part by weight to 4 parts of air-slaked lime. A cheese cloth bag is convenient as a duster. The material should be applied preferably when the dew is on so that it will stick to the leaves.

**CABBAGE MAGGOT**—The cabbage maggot is another serious pest of the gardener. The parent insect is a tiny fly that deposits its white eggs in crevices of the soil near the base of the cabbage plants. Here they hatch and the small white maggots burrow into the roots or tunnel along the surfaces of the roots. The maggots completely destroy the root systems of young plants, check their growth and cause them to wilt and die. The maggots are also very injurious to young plants in the seed bed.

The most effective method of control for plants in the field yet devised is to place about the stem of each plant soon after it is set hexagonal disks of tarred paper.

Another method of control, perhaps better adapted to the home garden, is to make a slight depression about the stem of each plant and pour into it a tablespoonful of diluted crude carbolic acid emulsion made as follows: Hard soap, 1 pound, or soft soap, 1 quart; boiling water, 1 gallon; crude carbolic acid, 1 pint.

The soap should be dissolved in the water and the carbolic acid added. Then the mixture should be churned rapidly until a creamy white emulsion is formed. This should then be diluted by adding 30 times its bulk of water. That is, a teaspoonful of the emulsion should be diluted with 30 teaspoonfuls of water and then a tablespoonful of this diluted solution put in the depression about each plant.

Plants in seed beds may be effectively protected by screening them with cheese cloth having 20 to 30 threads to the inch. The cloth is stretched tightly over the bed and nailed to the edges of boards 8 inches wide set up on edge around the bed. The dirt is thrown up about the edges of the boards so that the flies cannot crawl under them. The cloth should be removed about one week before it is time to set the plants in the field.

**CABBAGE APHID**—This aphid often occurs in enormous numbers on cabbages, not so much in gardens as in larger fields. The aphids are greenish in color and covered with a fine whitish powder. They cluster on the upper undersides of the leaves and suck out the juices of the plant, causing the leaves to curl, wilt and finally die.

### Other Vegetable Pests.

Since aphids are sucking insects they must be controlled by some substance that will kill them when it comes in contact with their bodies. Kerosene emulsion will do this very effectively, but as it is rather bothersome to make a tobacco extract known as nicotine sulphate is much more universally used. Nicotine sulphate is a commercial preparation, the more common brand of which is known as black leaf 40, contains 40 per cent. of nicotine. For spraying most garden vegetables infested with aphids or other sucking insects the black leaf 40 is added to water at the rate of three-quarters of a pint to 100 gallons of water, or, in smaller amounts, one teaspoonful to a gallon of water. About three-quarters of an ounce of each gallon of the mixture. The soap increases the efficiency of the solution. Care should be taken to spray the under sides of the leaves.

**CABBAGE LOOPER**—The caterpillar of

this moth in some parts of the country is a very troublesome pest, especially to late cabbage. The caterpillar is pale green in color and indistinctly striped on the back and on each side with whitish lines. It moves about with a looping gait like the common measuring worms.

Since this insect passes the winter usually as a pupa within a light, silken cocoon, clean culture is most useful in holding the pest in check. The old leaves, stumps and heads lying in the fields may harbor the overwintering pupae in their cocoons. Therefore all refuse in gardens and fields should be gathered in the fall and burned or otherwise destroyed. This is an important practice also in the case of other garden pests.

In addition the poison mixture of soap and arsenate of lead recommended for the imported cabbage worm is useful in case of the cabbage looper. The spraying should be done very thoroughly, using great care to cover all parts of the plant.

**CUTWORMS**—Certain caterpillars, known as cutworms, constitute an important enemy of cabbages. There are several species that injure the plants, but their habits are much the same.

Cutworms are sleek, robust caterpillars from one to two inches long. They are yellowish, greenish, dirt-colored or grayish, or sometimes striped or variously marked with dull dark or brown areas. They hide beneath some object on the ground or crawl just below the surface of the soil during the day, coming out at night to do their feeding.

Clean culture by burning all refuse and ploughing deeply in the fall is of advantage. Eggs laid on leaves of weeds will be destroyed and many of the half grown cutworms will be killed by deep ploughing.

Poison bait made of bran 10 pounds, Paris green or white arsenic 1 pound, and molasses 1 or 2 quarts is very effective. Enough water should be added to moisten the bran so that the particles will adhere to each other and yet not so much as to make a soft mash that will not crumble. A handful of this mash should be placed around each plant or it may be scattered thinly between the rows.

A method of protecting young cabbage plants from cutworms is to encircle each plant when set with a strip of tin 4 inches wide and 12 inches long.

### Pests of Cucumbers and Squashes.

Cucumbers, squashes and melons are attacked especially by the striped cucumber beetle (*Dibrotica vittata*), the squash bug (*Anasa tristis*), and the squash-vine borer (*Melittia striatiformis*), and occasionally by the melon aphid (*Aphis gossypii*).

**STRIPED CUCUMBER BEETLE**—This insect is about one-quarter of an inch in length, and except the head, which is black, is orange-yellow in color with three longitudinal black lines on the back. The beetles appear early in the spring before the cucumbers are up and feed on nearly anything they can find. When the cucumber plants appear above the ground the beetles begin at once to feed on the first tender leaves, riddling them with holes. Later they feed on the blossoms, especially the pollen, and on the foliage of the vines.

Clean culture about the borders of the garden to destroy the hibernating pieces of the beetles and to prevent the growth of the weeds in the early spring is of considerable value in the fight against this insect.

Young plants may be protected with screened boxes or covers. A box without top or bottom set over the hill and then covered over the top with muslin or wire screening will protect the plants from early injury. A barrel hoop cut in half and the pieces crossed in the middle, with the ends stuck in the ground and then covered with muslin will serve the same purpose. Any cover of this kind must be removed after the plants begin to run.

Dusting plants heavily at frequent intervals with air-slaked lime or tobacco dust will repel the beetles and if persistently followed up will protect the plants satisfactorily. Spraying the plants and keeping them well covered with paste arsenate of lead, 2 pounds to 50 gallons of water, or Bordeaux mixture, is effective.

**SQUASH BUG**—Another troublesome pest is the squash bug. The adult bug is about five-eighths of an inch long, dark brown above and mottled with yellow. The young bugs, which hatch from brown eggs laid on the undersides of the leaves, are light green in color. The full grown insects pass the winter hidden in nooks and crannies under boards and rubbish wherever they can find a snug retreat and appear in June as a rule.

### Early Work Essential.

About the only effective method of control in a garden is to catch the overwintering bugs by hand before they deposit their eggs. The bugs may be caught most easily in the early morning before they become active. If pieces of boards, bark, shingles or similar objects are laid on the ground the bugs will crawl beneath them and may be caught and killed in the early morning. A close watch must be kept for the bugs as they appear in the spring so as to catch them before they deposit their eggs. If the eggs are deposited they should be crushed or scraped from the leaves with a knife. The young bugs may be hand-picked or they may be killed by spraying with nicotine sulphate, 1 pint to 50 gallons of water to which 4 pounds of soap should be added.

**SQUASH VINE BORER**—This borer is often a very troublesome pest of the gardener and is a difficult one to control. The parent insect is a handsome moth, with transparent hind wings and with the body marked with orange or red and black or bronze.

The moth lays her oval, dull red eggs on all parts of a plant, but principally on the stems. The eggs hatch and the young caterpillars bore into the leaf stalks and the stems and then burrow along the center. When the caterpillars are full grown they go down into the ground from one to two inches and change to pupae in earthen cells, where they remain all winter.

In the first place, gardens which are troubled with this insect should be harrowed thoroughly in the fall to break up the pupal cells and bring the pupae up to the surface, where they will be winter killed. Early in the spring the garden should be ploughed deeply in order to bury any pupae



CHILD LABORERS IN ALGERIA  
POSED FOR THE RED CROSS  
FILM  
Photos Courtesy American Red Cross

that may have lived through the winter.

If infestation is anticipated the stems of the squash plants should be covered here and there with dirt as they begin to run. The stems will send out at the points where they are covered secondary roots, which will support the plants in case the main stem near the base of the plant is killed by the borers.

Finally the borers may be cut out by hand. They can be located by the small heaps of sawdust like borings on the soil just under the stems where each borer is working. The vine should be slit lengthwise and the borer killed.

**MELON APHID**—This aphid, which sometimes occurs in enormous numbers on the leaves of melon plants, may be controlled by thorough and careful spraying with nicotine sulphate at the rate of one teaspoonful to one gallon of water, with an ounce of soap added to increase the sticking and spreading powers of the liquid. An angle nozzle should be used, so that the undersides of the leaves may be reached with the spray.

### Insect Pests of the Potato.

The most important pest of the potato is the Colorado potato beetle (*Leptinotarsa 12-lineata*). The adult is a roundish beetle, brownish-yellow in color with ten black stripes along the back. It passes the winter usually deeply buried below the surface of the soil but sometimes simply beneath rubbish. The beetles appear early in the spring by the time the plants are up and after feeding for a few days begin to deposit their orange-red eggs on the under sides of the leaves in groups of 25 to 50. The eggs hatch into soft, reddish grubs that devour the foliage, often leaving nothing but the bare stems.

Paris green at the rate of 1 pound to 50 gallons of water is an efficient poison for this insect, but this amount should be applied to each acre of the plants. Where Bordeaux mixture is used on potatoes for the

blight the paris green may be combined with it. If the poison is used alone it will be best to add 2 or 3 pounds of quick lime to prevent any burning of the plants. If paris green and lead is used, at least 4 pounds to 50 gallons of water or of Bordeaux mixture will be necessary. The first application of poison should be made early while the plants are small.

Paris green may be combined with flour or air-slaked lime at the rate of 1 pound of the former to 20 pounds of the latter and dusted on the plants from a muslin bag, preferably while the dew is on. Powdered arsenate of lead at the rate of 1½ pounds to 20 pounds of lime can be used in the same way.

**POTATO FLEA BEETLE**—This tiny flea-beetle is also a serious enemy to potatoes in some years and in some localities. The flea-beetles are small black beetles only about 1-16 of an inch in length, that have strong hind legs and jump quickly like fleas. They sometimes occur in great numbers on potatoes, tomatoes and egg plants, to which they are very destructive. They live on the under sides of the leaves and finally cause the foliage to become fairly caddled with small shot-like holes. The leaves wither and roll up and the plant when badly injured looks as though it had been scorched.

The most effective way to control the flea beetle is to keep the plants covered with Bordeaux mixture. The plants should be sprayed every ten to fourteen days for the blight, and pains should be taken to cover the under sides of the leaves. Poisons do not seem to be effective, although when they are used for the Colorado potato beetle probably some flea beetles are also killed.

**PINK AND GREEN POTATO APHID**—Within the last three or four years the pink and green potato aphid has been abundant and injurious in many localities where potatoes are grown. The plants become covered with the aphids and the foliage withers and dies. Infested plants must be sprayed thoroughly and carefully with nicotine sulphate at the rate of 1 teaspoonful to a gallon of water to which an ounce of soap has been added.

### Insect Pests of the Tomato.

The tomato is attacked by various cutworms, by the potato flea beetle, the tomato fruit worm (*Chloridea obsoleta*), and by the white fly (*Aleyrodes tomentosum*), especially when grown under glass.

The cutworms and their habits have already been discussed under the head of cabbage pests and need no further comment here, except to say that the poisoned bran mash is equally useful in destroying the species that attack tomatoes.

The potato flea beetle is quite as injurious to tomatoes as to potatoes, and the infested plants should be kept covered with Bordeaux mixture, taking special care to coat the under sides of the leaves.

**TOMATO FRUIT WORM**—The fruit worm of the tomato is the caterpillar that eats cavities into the sides of both ripe and unripe fruits. When young it may attack the stems and leaves of the plant, but as soon as the fruit sets it goes to the young tomatoes and attacks them as described. This

eye. The squalor which surrounds these poor young ones and the absence or complete neglect of anything like sanitation in their lives, surrounding them from infancy with vermin which prey upon the eye, are the ordinary causes. Blindness in adult life is the natural corollary.

Of 6,025 school children examined by physicians in various parts of Algeria, 1,850, or 24 per cent, were found to have trachoma. And it must be remembered that Algeria merely debouches on the Saharan desert, the nomadic tribes that wander from oasis to oasis further within its desolation are in far worse condition. Their hard case can not be estimated, but the Algerian children have been numbered and may be helped. An appeal was sent to the American Red Cross by the Marabout of Temassine for aid of these children. And it is here on the edge of the desert that the Junior Red Cross has begun a campaign against blindness among the natives.

Besides doing all in its power to counteract or eliminate the conditions that bring on loss of eyesight among the Arab tribes the Juniors of America are starting a campaign to educate the children of these tribes. Scholarships are to be provided which will enable the children of the desert to obtain practical and scientific education which will improve living conditions among them. The pictures used will show these conditions as new existing, and no verbal appeal to change them could be half so effective.

### Pictures of Famed Oasis.

Among the moving pictures registered by Capt. Le Voy's camera are those taken in Blakra, a noted oasis, within the French zone. Blakra is about as far as most desert travelers get, and it has greatly improved under their visits. While working the film machine Le Voy succeeded in persuading Robert Hichens, author of "The Garden of Allah," who was there at the time working on another African novel, to figure in it. As he is a popular author he will be identified when the film is finally shown.

But the desert children are the main interest in the pictures, and full details of their lives will be seen for the first time in this country. A pretty child of Sahara, eight years old, whose home is in Toggourt, Algeria, was one of the actors. Other children, at work on the beautiful rugs for which Algeria is famous, appear in the film. These children are from 10 to 12 years old. The picture shows them working on a rug. A pattern for them to follow has been hung in front of them by their mother, and they "carry on" like veteran weavers. The school children of America, for whom this movie, "The Children of the Sahara," is designed, are sure to be delighted with these episodes. Lately there has been a wide demand made by churches, colleges, schools and other organizations for educational and scenic pictures from Africa. Individual pictures taken by the cameraman of Red Cross commissions did not seem to satisfy this demand, and therefore the Red Cross Bureau of Pictures undertook the production of such films as would prove both interesting and instructive. A nominal rental fee is charged wherever they are shown, enough merely to cover actual cost of production. The films are distributed through local divisions of the Red Cross.

tomato fruit worm is the same caterpillar that gnaws into the tips of ears of corn and further South it works in bolts of cotton. In fact it is known as the corn ear worm and the cotton boll worm.

It is possible and practicable in a home garden to collect and destroy the caterpillars by hand. When tomatoes are found with the caterpillars wholly buried within the fruit they should be picked and destroyed. At the end of the season the vines and fruit, if infested, should be burned or otherwise destroyed.

**WHITE FLY**—The so-called white fly, a tiny insect with four snow white wings, often proves a very serious pest to tomatoes and cucumbers, especially when grown in greenhouses. It may also attack many plants grown by the florist and in the summer season often becomes a pest on many plants growing out of doors.

In greenhouses the white fly can probably be best controlled by fumigation with hydrocyanic acid gas.

Radishes are troubled by one insect only, as a rule, but this one is often very serious. We refer to the common cabbage maggot, already discussed under cabbage pests. The maggots are sometimes so abundant that they literally riddle the radishes with their burrows and may cause the interiors to turn dark and decay.

There are two practicable methods of fighting this pest on radishes. First, experiments have shown that when radishes are sown early enough so that they can be pulled during the latter part of May or certainly by the first week in June, in Central New York, they will not be injured to any extent by this insect. Second, it has been shown that radishes grown under muslin, as described for cabbage plants in the seedbed, will grow more rapidly, become more succulent and tender and will, of course, be entirely free from maggot injury.

### Pests of Sweet Corn.

Sweet corn is subject to injury by a number of insects, notably different cutworms, certain wireworms and the corn earworm (*Chloridea obsoleta*).

Perhaps the corn earworm is the only one that deserves attention here. It works in the tips of the ears, where it devours the kernels and often burrows down the whole length of the ear. The moth deposits her whitish oval eggs on the silk of the corn, where they hatch, and the caterpillars crawl down among the husks and attack the soft kernels.

The only feasible method of control for this pest in gardens is to dust the ends of the ears with powdered arsenate of lead. The poison should be thoroughly mixed with sulphur in the proportions of three-quarters of a pound of the poison to one-quarter of a pound of sulphur.

# Red Cross Films Sahara Children

## Remarkable Pictures to Be Used in Campaign Against Blindness Among the People of the Desert

THE desert of Sahara is at last coming into the movies in a way less spectacular but more realistic than it has so far been used to illustrate a scenario laid there. The American Red Cross, through its agent, Capt. Merle Le Voy of Seattle, Wash., has prepared a series of pictures constituting a film to be called "The Children of the Sahara." Incidentally this film, showing the life of the nomadic races inhabiting the desert, Bedouins and other Arabian tribes, is sure to attract wide interest, and it will at the same time awaken pitying interest in the unfortunate conditions surrounding childhood under the hot African sun.

### Most of the Children Afflicted.

It is a matter of notoriety brought back by travellers in the Far East, preceding and since the publication of the book, "Eothen," that the children of the desert are almost universally afflicted with diseases of the



## Science Comes to Aid of "Black Sheep"

WHAT would you do to your boy if he ran away from home?

Would you give him a good licking, or would you spare the rod in favor of a nice, long lecture, or would you follow the Biblical example of sending around to the butcher's for his most highly fattened calf?

Science says you would do well to postpone such actions until after a trip to the doctor's. A thorough medical examination might disclose the fact that your boy simply couldn't help running away, and that a doctor's treatment would do him more good than rod, lecture and fatted calf combined.

The same thing is true of other "bad" boys or girls, those who are mercurial and hard to manage, and those who are "bad" enough to be classed as incorrigibles, or "black sheep." A medical examination may be just the thing the boy needs. Science has a way of dealing with incorrigibles which offers hope that in the future the majority of them can be permanently helped. The story of what science can actually accomplish is nearly a parallel to what can be done toward solving the problem of criminality. The solution lies in the study of psychology, and the road runs through the equipment of a modern laboratory specially designed for psychopathic medical examination.

Here in the laboratory, according to good medical authority, lies the hope for the runaways, the juvenile delinquents, the brilliant drifters, the confirmed failures and all the rest of humanity's by-products, from the boy who is hard to manage to the tramp in the city parks. Here, some time in the future, the coat of black may be dyed to fleece of snowy white.

"The first thing to be understood about these people," says Dr. Max G. Schlapp, of the neurological department of the New York Post-Graduate Medical School and Hospital, "is that they are unable to adjust themselves normally to their environments for the very important reason that the motivating activities of their brains are seriously disturbed."

"It is the disturbance in the emotional centre, with persons perfectly normal intellectually, which upsets the normal balance, throws the unfortunate sufferer out of touch with his environment and causes the wayward and abnormal acts which are due to nothing else than to waves of uncontrollable feeling which completely subjugate the inhibitions of the intellect. This, for instance, accounts for the boy who, surrounded by an affectionate family in a home of ease, runs away repeatedly, undergoes unnecessary hardships and when brought back can never give any explanation for his acts except that he 'just wanted to get away.'"

There is a perfectly good reason why even a minister is unable to reform his wayward son. No amount of preaching, reforming and character talks will do such persons any good whatever. Their brain cells are physically affected, not necessarily through injury and not necessarily through lack of development, but through a disturbance in the proportion of the different chemical factors in the surrounding medium from which the cells draw their necessary potential energy and activating substances. Therefore, such cells do not react normally to stimulation.

"What can be done in the future depends, as usual, on further research," says Dr. Schlapp, "and at present there is no provision for the necessary constant observation and treatment; treatment which may mean the salvation of many 'criminals,' as well as the hope of families with 'black sheep.' The laboratory is the place for the development of this corrective work, and it is partly for an extension of existing facilities for this work that the New York Post-Graduate Hospital is now trying to raise an endowment fund."

"We want to teach other doctors what we have learned, in an extended course of post-graduate instruction, and we want to make further strides into the unknown. It may be that private philanthropy once more will blaze the trail of progress, but that time surely cannot be far off when the State will avail itself of the more humane and common sense methods which science has to offer in the care of the hopelessly unfortunate."